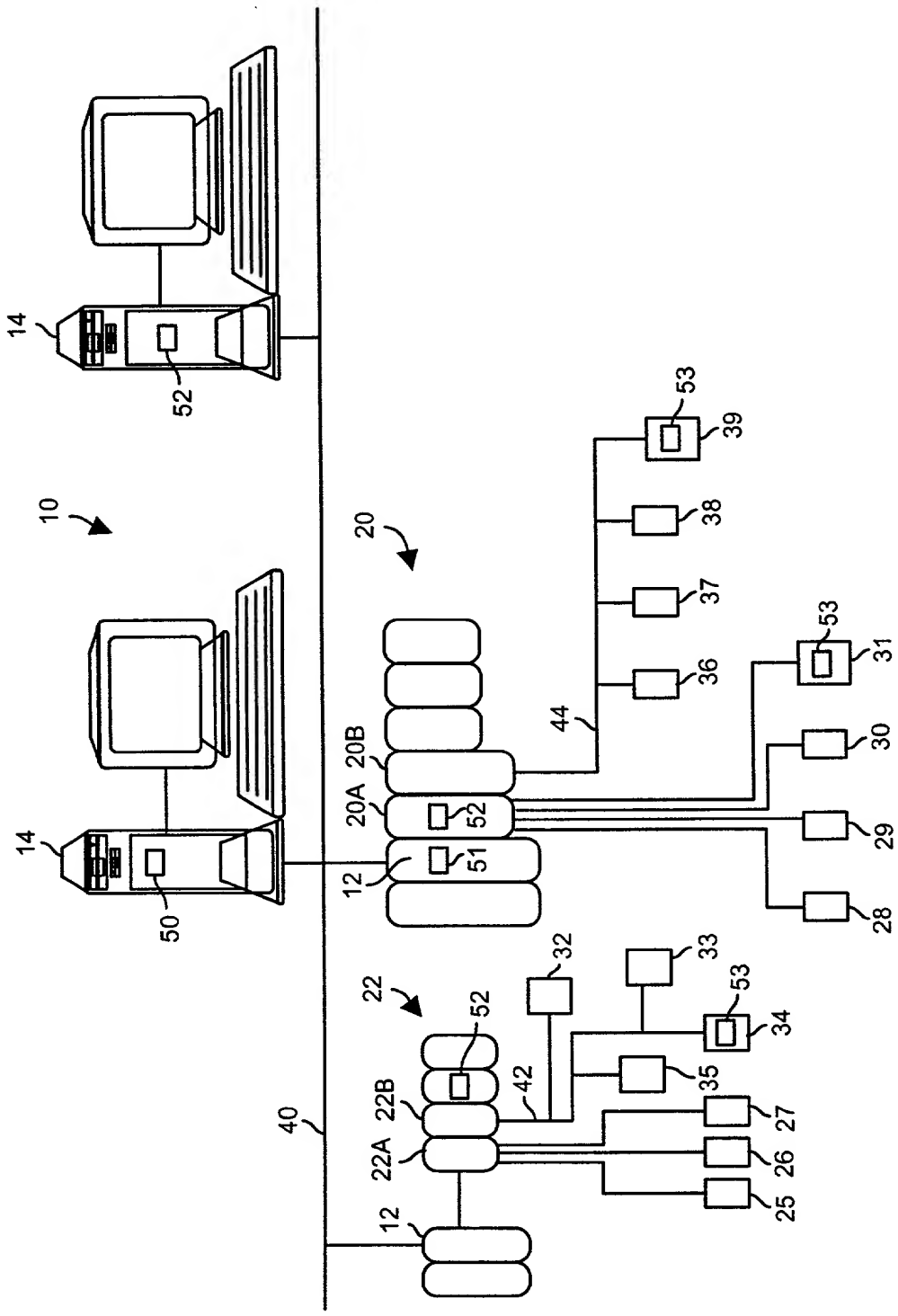

10
14
52
14
50
20
20B
20A
52
51
12
44
53
39
38
37
36
53
31
30
29
28
22
52
22B
22A
12
40
42
32
33
53
34
35
27
26
25

FIG. 1

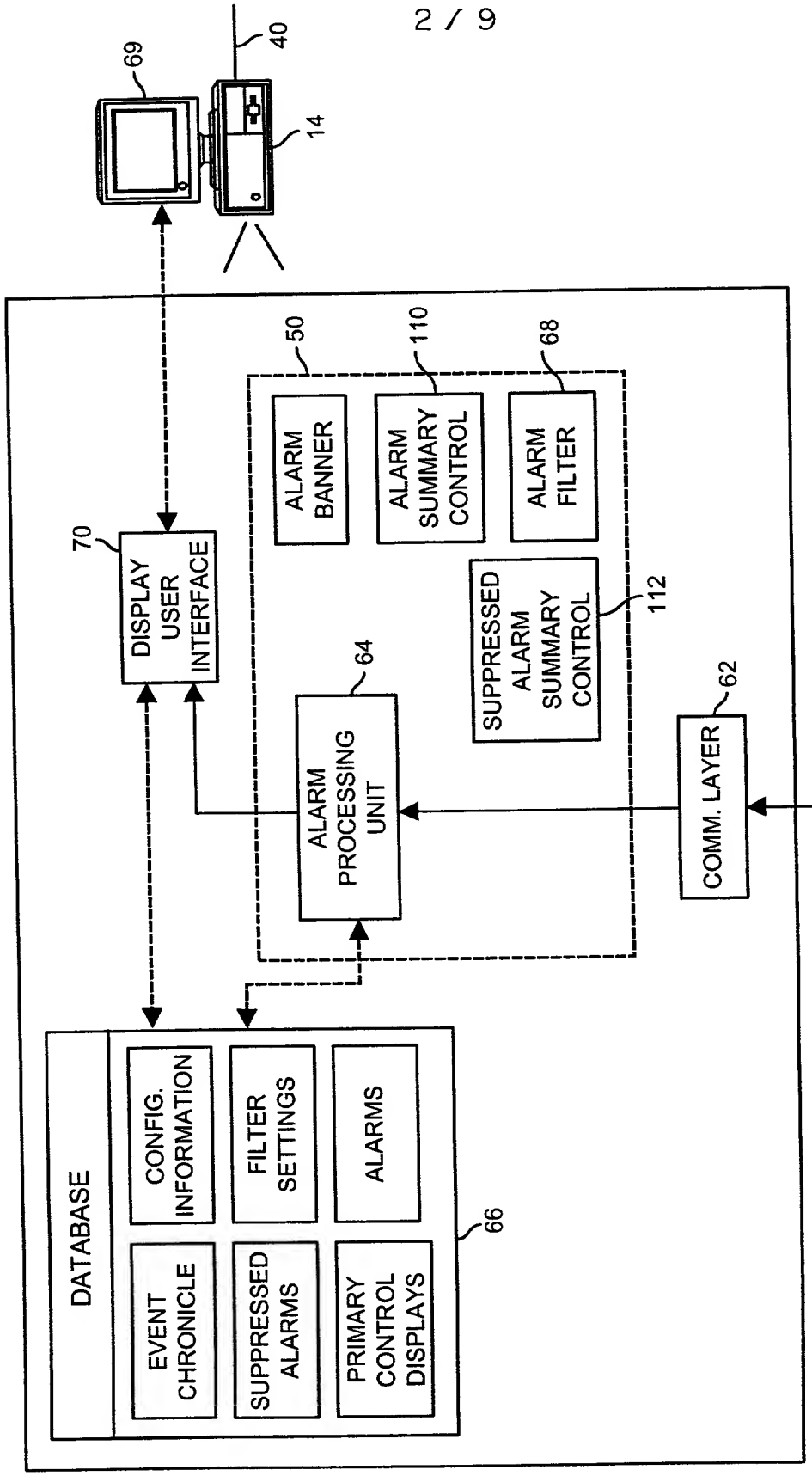

69
40
14
50
110
68
ALARM BANNER
ALARM SUMMARY CONTROL
ALARM FILTER
70
DISPLAY USER INTERFACE
SUPPRESSED ALARM SUMMARY CONTROL
112
64
ALARM PROCESSING UNIT
62
COMM. LAYER
FROM 40
DATABASE
CONFIG. INFORMATION
FILTER SETTINGS
ALARMS
EVENT CHRONICLE
SUPPRESSED ALARMS
PRIMARY CONTROL DISPLAYS
66

FIG. 2

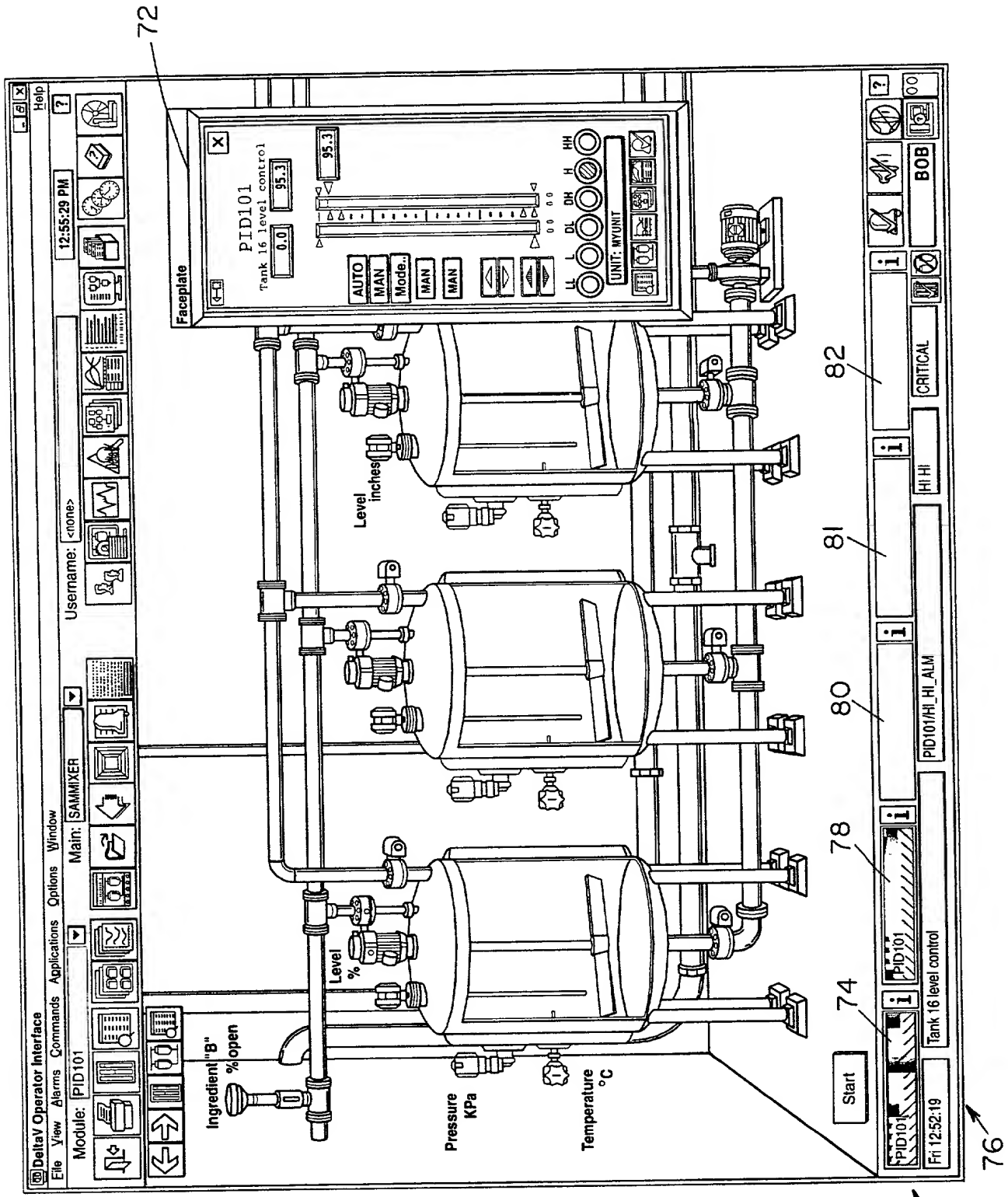

72
DeltaV Operator Interface
File View Alarms Commands Applications Options Window Help
Module: PID101
Main: SAMMIXER
Username: <none>
12:55:29 PM
Faceplate
PID101
Tank 16 level control
95.3
0.0
AUTO
MAN
Mode..
UNIT: MYUNIT
Level inches
Level %
Ingredient "B" %open
Pressure KPa
Temperature °C
Start
Tank 16 level control
Fri 12:52:19
PID101/HI_HI_ALM
HI HI
CRITICAL
BOB
82
81
80
78
74
76
71
73

FIG. 3

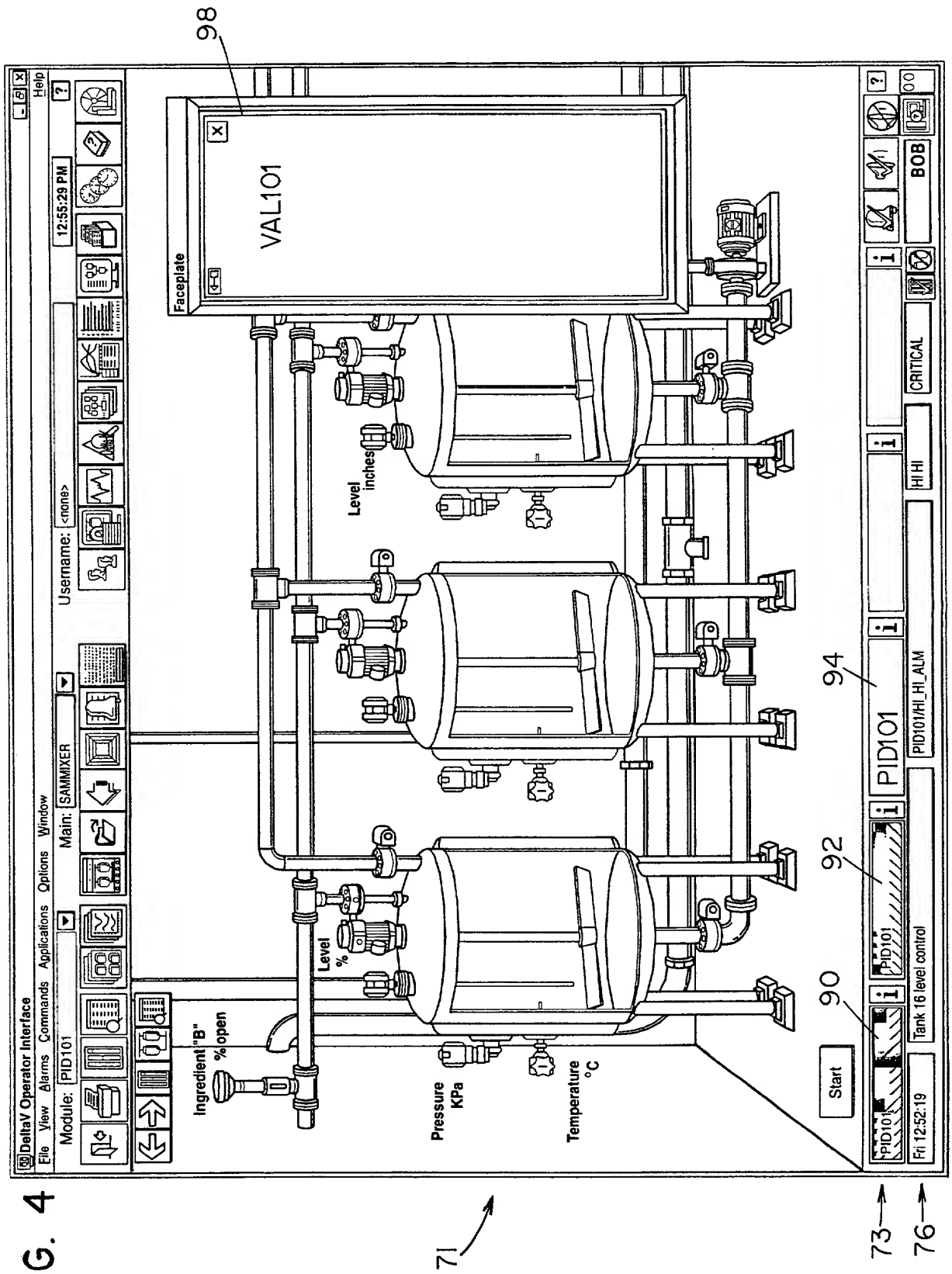
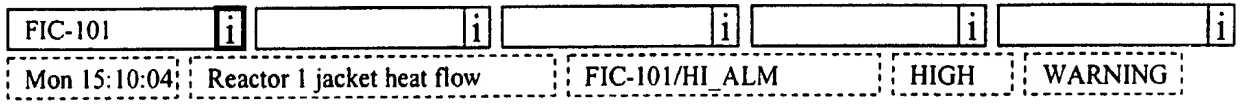

98
DeltaV Operator Interface
File View Alarms Commands Applications Options Window Help
Module: PID101
Main: SAMMIXER
Username: <none>
12:55:29 PM
Faceplate
VAL101
Level inches
Level %
Ingredient "B" %open
Pressure KPa
Temperature °C
Start
90
92
94
PID101
PID101/HI_HI_ALM
HI HI
CRITICAL
BOB
Tank 16 level control
Fri 12:52:19
71
73
76

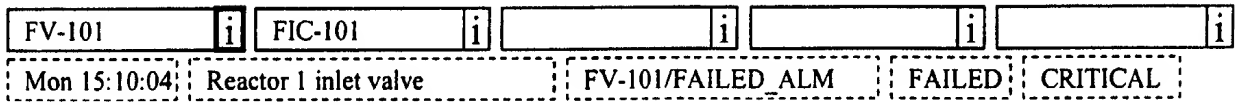
FIG. 4

Docket No.: 06005/37172
Title: Enhanced Device Alarms in a Process Control System
Inventor: Robert B. Havekost
Sheet 5 of 9 (figs. 5-7)



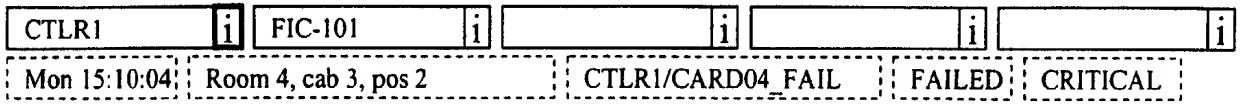
Time	Unit	Alarm Parameter	Module Description	Alarm Word	Alarm Message	Priority
Mon 15:10:04	REACTOR1	FIC-101/HI_ALM	Reactor 1 jacket heat flow	HIGH	High Alarm Value 1027 Limit 1000	WARNING

FIG. 5



Time	Unit	Alarm Parameter	Module Description	Alarm Word	Alarm Message	Priority
Mon 15:10:04	REACTOR1	FV-101/FAILED_ALM	Reactor 1 inlet valve	FAILED	I/P Feedback limit: 103.47	CRITICAL

FIG. 6



Time	Unit	Alarm Parameter	Module Description	Alarm Word	Alarm Message	Priority
Mon 15:10:04		CTLR1/CARD04_FAIL	Room 4, cab 3, pos 2	FAILED	Channel 7 failed	CRITICAL

FIG. 7

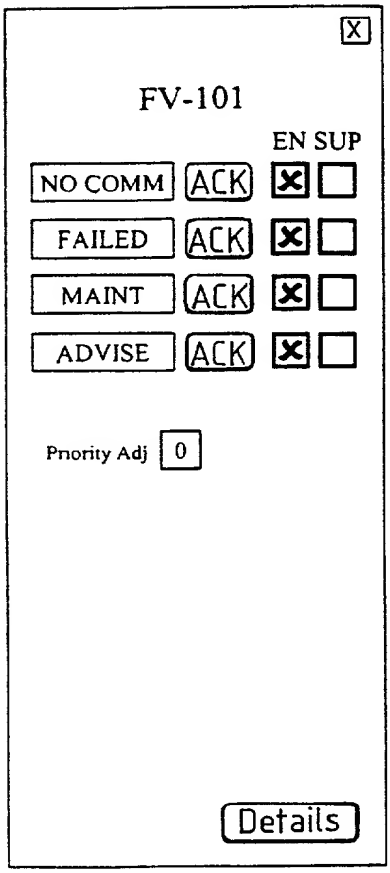

X
FV-101
EN SUP
NO COMM
ACK
FAILED
ACK
MAINT
ACK
ADVISE
ACK
Priority Adj
0
Details

FIG. 8

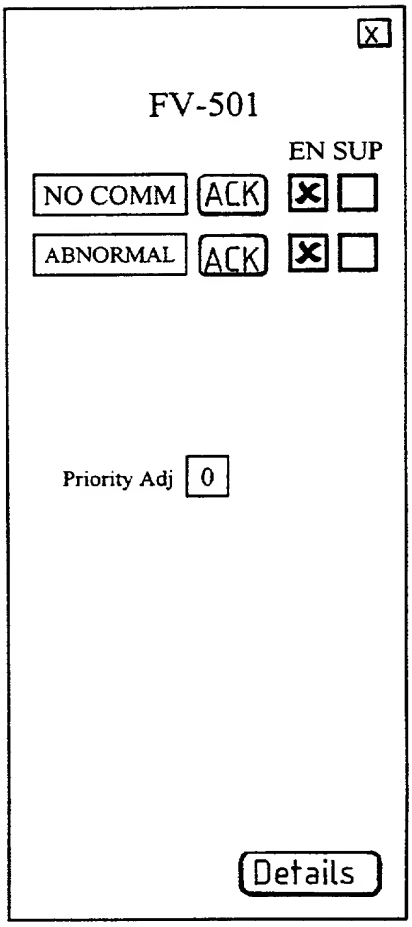

X
FV-501
EN SUP
NO COMM
ACK
ABNORMAL
ACK
Priority Adj
0
Details

FIG. 9

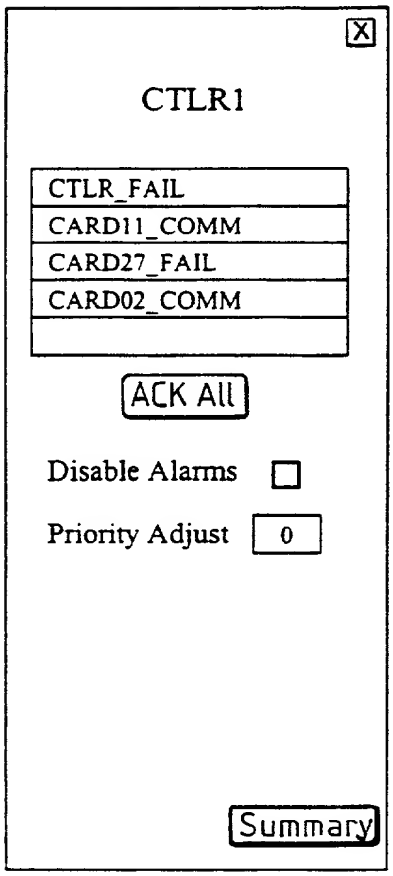

CTLR1
CTLR_FAIL
CARD11_COMM
CARD27_FAIL
CARD02_COMM
ACK All
Disable Alarms
Priority Adjust
0
Summary

FIG. 10

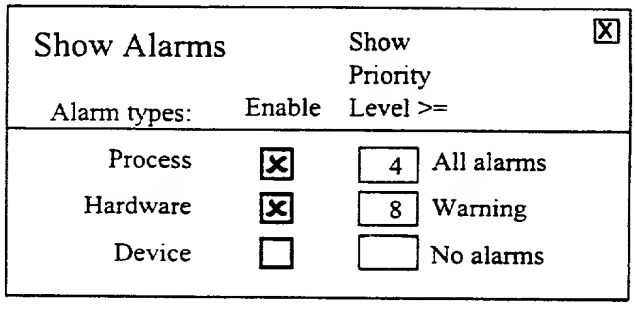

Show Alarms
Alarm types:
Enable
Show Priority Level >=
Process
4
All alarms
Hardware
8
Warning
Device
No alarms

FIG. 11

	Occurred	Unit	Alarm Parameter	Description	Alarm	Message	Priority
	Wed 12:46:30		FIC-501/HI_ALM	Tank 5 outlet flow control	HI	Value = 1011.4 Limit = 1000	WARNING
▒	Wed 11:48:54	REACTOR1	FV-101/FAILED_ALM	Reactor 1 jacket flow sensor	FAILED	I/P Feedback limit 103.7	WARNING
✓	Wed 10:51:18	REACTOR3	LIC-301/HI_HI_ALM	Reactor 3 Level control	HIHI	Value = 81.4 Limit = 78	CRITICAL
✓	Wed 09:53:42		FIC-501/HI_ALM	Tank 5 outlet flow control	HI	Value = 1011.4 Limit = 1000	WARNING
✓	Wed 08:56:06	REACTOR2	FV-102/MAINT_ALM	Reactor 2 jacket flow sensor	MAINT	Travel limit 35001	WARNING
✓	Wed 07:58:30		FIC-501/HI_ALM	Tank 5 outlet flow control	HI	Value = 1011.4 Limit = 1000	WARNING
✓	Wed 07:00:54		FIC-501/HI_ALM	Tank 5 outlet flow control	HI	Value = 1011.4 Limit = 1000	WARNING
✓	Wed 06:03:18	REACTOR1	LIC-101/HI_HI_ALM	Reactor 1 Level control	HIHI	Value = 81.4 Limit = 78	ADVISORY
✓	Wed 05:05:42	REACTOR2	LIC-102/HI_HI_ALM	Reactor 2 Level control	HIHI	Value = 81.4 Limit = 78	ADVISORY
✓	Wed 04:08:06		FV-502/ADVISE_ALM	Tank 5 outlet flow sensor	ADVISE	Low variation for 60 minutes	ADVISORY

Process: 1 / 34 Device: 1 / 2 Sort: Banner

FIG. 12

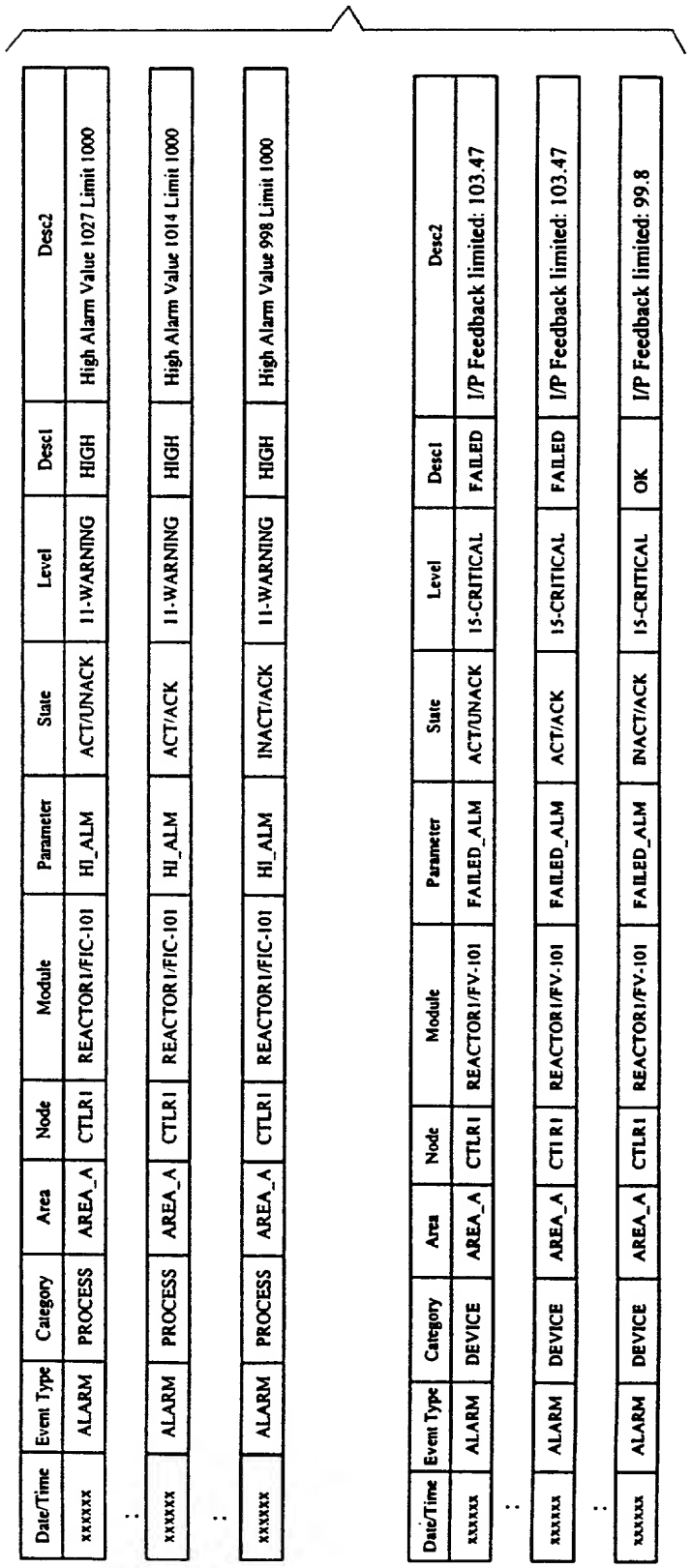
	Occurred	Unit	Alarm Parameter	Description	Alarm	Message	Priority
	Wed 12:46:30		FIC-501/HI_ALM	Tank 5 outlet flow control	HI	Value = 1011.4 Limit = 1000	WARNING
▒	Wed 11:48:54	REACTOR1	FV-101/FAILED_ALM	Reactor 1 jacket flow sensor	FAILED	I/P Feedback limit 103.7	WARNING
✓	Wed 10:51:18	REACTOR3	LIC-301/HI_HI_ALM	Reactor 3 Level control	HIHI	Value = 81.4 Limit = 78	CRITICAL
✓	Wed 09:53:42		FIC-501/HI_ALM	Tank 5 outlet flow control	HI	Value = 1011.4 Limit = 1000	WARNING
✓	Wed 08:56:06	REACTOR2	FV-102/MAINT_ALM	Reactor 2 jacket flow sensor	MAINT	Travel limit 35001	WARNING
✓	Wed 07:58:30		FIC-501/HI_ALM	Tank 5 outlet flow control	HI	Value = 1011.4 Limit = 1000	WARNING
✓	Wed 07:00:54		FIC-501/HI_ALM	Tank 5 outlet flow control	HI	Value = 1011.4 Limit = 1000	WARNING
✓	Wed 06:03:18	REACTOR1	LIC-101/HI_HI_ALM	Reactor 1 Level control	HIHI	Value = 81.4 Limit = 78	ADVISORY
✓	Wed 05:05:42	REACTOR2	LIC-102/HI_HI_ALM	Reactor 2 Level control	HIHI	Value = 81.4 Limit = 78	ADVISORY
✓	Wed 04:08:06		FV-502/ADVISE_ALM	Tank 5 outlet flow sensor	ADVISE	Low variation for 60 minutes	ADVISORY

Process: 1 / 34 Device: 1 / 2 Sort: Banner

FIG. 13

	Occurred	Unit	Alarm Parameter	Description	Alarm	Message	Priority
	Wed 12:46:30		FIC-501/HI_ALM	Tank 5 outlet flow control	HI	Value = 1011.4 Limit = 1000	WARNING
▒	Wed 11:48:54	REACTOR1	FV-101/FAILED_ALM	Reactor 1 jacket flow sensor	FAILED	I/P Feedback limit 103.7	WARNING
✓	Wed 10:51:18	REACTOR3	LIC-301/HI_HI_ALM	Reactor 3 Level control	HIHI	Value = 81.4 Limit = 78	CRITICAL
✓	Wed 09:53:42		FIC-501/HI_ALM	Tank 5 outlet flow control	HI	Value = 1011.4 Limit = 1000	WARNING
✓	Wed 08:56:06	REACTOR2	FV-102/MAINT_ALM	Reactor 2 jacket flow sensor	MAINT	Travel limit 35001	WARNING
✓	Wed 07:58:30		FIC-501/HI_ALM	Tank 5 outlet flow control	HI	Value = 1011.4 Limit = 1000	WARNING
✓	Wed 07:00:54		FIC-501/HI_ALM	Tank 5 outlet flow control	HI	Value = 1011.4 Limit = 1000	WARNING
✓	Wed 06:03:18	REACTOR1	LIC-101/HI_HI_ALM	Reactor 1 Level control	HIHI	Value = 81.4 Limit = 78	ADVISORY
✓	Wed 05:05:42	REACTOR2	LIC-102/HI_HI_ALM	Reactor 2 Level control	HIHI	Value = 81.4 Limit = 78	ADVISORY
✓	Wed 04:08:06		FV-502/ADVISE_ALM	Tank 5 outlet flow sensor	ADVISE	Low variation for 60 minutes	ADVISORY

FIG. 14



Date/Time	Event Type	Category	Area	Node	Module	Parameter	State	Level	Desc1	Desc2
xxxxxx	ALARM	PROCESS	AREA_A	CTLR1	REACTOR1/FIC-101	HI_ALM	ACT/UNACK	11-WARNING	HIGH	High Alarm Value 1027 Limit 1000
:										
xxxxxx	ALARM	PROCESS	AREA_A	CTLR1	REACTOR1/FIC-101	HI_ALM	ACT/ACK	11-WARNING	HIGH	High Alarm Value 1014 Limit 1000
:										
xxxxxx	ALARM	PROCESS	AREA_A	CTLR1	REACTOR1/FIC-101	HI_ALM	INACT/ACK	11-WARNING	HIGH	High Alarm Value 998 Limit 1000

Date/Time	Event Type	Category	Area	Node	Module	Parameter	State	Level	Desc1	Desc2
xxxxxx	ALARM	DEVICE	AREA_A	CTLR1	REACTOR1/FV-101	FAILED_ALM	ACT/UNACK	15-CRITICAL	FAILED	I/P Feedback limited: 103.47
:										
xxxxxx	ALARM	DEVICE	AREA_A	CTLR1	REACTOR1/FV-101	FAILED_ALM	ACT/ACK	15-CRITICAL	FAILED	I/P Feedback limited: 103.47
:										
xxxxxx	ALARM	DEVICE	AREA_A	CTLR1	REACTOR1/FV-101	FAILED_ALM	INACT/ACK	15-CRITICAL	OK	I/P Feedback limited: 99.8

FIG. 15